New methods and techniques of research into economic history in Czechoslovakia

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NEW METHODS AND TECHNIQUES OF RESEARCH INTO ECONOMIC HISTORY IN CZECHOSLOVAKIA[+)]

In this paper I shall restrict myself to the application of quantitative methods and computers to the research into the economic history of Czechoslovakia and to papers which deal with the problems of methodology, method and technique in this field, which we might call economic historiometrics. I used the term historiometrics for the first time in 1962 in a report to the 1st Czechoslovak Cybernetics Conference in Praque. 1) The subject of historiometrics in this concept is the study of the measure of historical processes, i.e. the regularities of the development of the relation between their quantitative and qualitative determinations using specific historical, as well as mathematical methods. The name historiometrics seemed slightly unusual, however, it is suitable for two reasons in particular: it expresses the fact that historiometrics deal with a) the measurable aspect of historical processes, and b) the determination of their measure (metron). The term "histoire quantitative" is unilateral, because it only emphasizes the quantitative side without its association with the qualitative characteristic, the term "new economic history" stresses the novelty in the name directly, but does not say to what it pertains, the mythologically attuned term "cliometrics" is indicative of the Muse of History and of metrics, however, we are interested in the measure of historical processes themselves rather than in the vital statistics of Kleio, the Muse of History. One may, therefore, hope that the uniformly sounding international name historiometrics (in French: l'historiométrie, in German: die Historiometrik, in Russian: istoriometriya) in the sense mentioned above, will gradually become internationally recognized.

In the broader associations of investigating the stimuli which cybernetics and the theory of information provided towards the new orientation of history, I dealt with some of these questions already at the beginning of the sixties.2) In this treatise I pointed out that modern electronic computers will enable us to meet the call for historical analysis to be founded on the knowledge of all indisputable facts and of the relations between them (e.g., processing to taxation cadastres, references concerning censues and other statistical data, history of prices, investigation of the trends of various aspects of economic and demographic development, testing the measure of probability of certain hypotheses, etc.). In connection with these deliberations I prepared a report on the dependence of the growth of the strike movement on the development of factory production in Bohemia and in Germany in the 2nd half of the 19th century, the abstract of which was presented at the 2nd Inter-

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national Conference in Economic History in Aix-en-Provence in September of 1962.[3] The mathematical model was expressed by an exponential-type equation and the coefficient of correlation between the development of the strike movement and factory production for Bohemia in the period 1850-1890 r = +0.97, and for Germany in the period 1840-1880 r = +0.96. In connection with graphical representation I utilized several new methods of quantitative analysis in analysing the structure and dynamics of the development of industry in Bohemia in the last quarter of the 18th century,[4] and in 1962-63 in the cartographic processing of the contents of some maps, particularly concerning demographic conditions, in the Atlas of Czechoslovak History, making use of the computer centre of what was then the Central Administration of Geodesy and Cartography in Prague.[5]

Several other papers in this field deal with the phase shift of the Industrial Revolution, the asynchronous diffusion of steam drive in industry in Europe, and the measuring of various cases of asynchronism using the asynchron unit,[6] investigating the correlation between the development of the steam drive in industry and the indices of economic growth in Great Britain, France, Germany, Austria and Russia[7] in the 19th century, and the development of the increment of the steam drive in industry as an index of fluctuation of economic cycles in the 19th century.[8]

An international conference on the quantitative methods and the use of computers in studying history, "History and the Computer", at which I had the possibility of presenting a report dealing with the following problems in particular, was held at the university of Uppsala in Sweden in June 1973:

1. Historical information and historiometrics, cartographic information and historic-cartographic information.
2. Problems of representing information graphically.
3. The historical map as a product of topical cartography and the processing of historical data in map form.
4. Some examples of creating historical maps using computers, and international co-operation and co-ordination of research.

In this connection the problems of cartographic representation of events of economic history, encountered in preparing the Atlas of Czechoslovak History,[9] were also mentioned.

However, let us revert to the first half of the sixties, when other articles, dealing with the problems of using computers in historical research, also concerning economic history[10] in broader associations, were published, like J. Folta's information on Soviet treatise in this field[11] and several articles of L. Nový and J. Folta on the use of mathematical methods in the history of sciences.[12] Several treatises dealing with the

computer processing of information in archival and historical work and its prospects[13] were also published in the middle of the sixties. New methods and techniques of processing references of a mass nature were pointed out by H. Poppová.[14] J. Honc, who investigated the populational development of six generations of 125 Bohemian noble families between the beginning of the 16th and end of the 18th century,[15] analysed the input data on prices and salaries for transferring them to punch cards and computer processing them,[16] and deliberated upon the prospects of further exploitation of computers particularly in the field of historical demography,[17] made use of modern computer equipment in this research work.

The articles of K. Berka,[18] J. Řehák[19] and J. Bouška[20] contributed to the elucidation of several theoretical problems of measuring in the field of social sciences at that time. The importance of the system approach to processing data by computer was pointed out by J. Vlček,[21] whose conclusions are also valid in the field of application of these progressive research methods to economic history.

At the end of the sixties work in this field also began to gain momentum in Slovakia, particularly in connection with the construction of the first computer centre in 1969, which is exclusively devoted to the research into the exploitation of computers in social sciences, and which is located at the Faculty of Philosophy of the Comenius University in Bratislava. At that time an article was published in a specialized journal, concerning the use of computers in social sciences,[22] and a volume of translations of foreign papers was published, which reported on the use of computers and methods of higher mathematics in research into economic history in particular.[23]

Most recently research in this field has expanded and become more elaborate. A team of scientists at the Faculty of Philosophy of the Charles University in Prague expanded upon the work of the Soviet scientists I.D. Koval'chenko and L.V. Milov and, using a computer, they analysed the relations between the price of corn in Bohemian towns in the 2nd half of the 18th century, thus contributing to the elucidation of some questions of the forming of the domestic market for agricultural products in Bohemia, particularly by determing a number of correlation coefficients between the evolution of these prices on various markets. In this connection, the authors assumed a certain balancing influence of the capital Prague as the marketing and of the Elbe Valley region as the production centre of Bohemia, and they stressed the importance of trade routes for modifying price relations. They emphasized the necessity for applying specialized aspects in selecting the towns for which the prices of the individual kinds of corn were determined and which were then correlated. In order to eliminate randomness in the occurrence of some high correlations between considerably distant towns, they adopted the method of computer correlating and comparing

everything with everything.[24] M. Hroch and his collaborators recently pointed out new stimuli, emanating from present Sovjet historiography, particularly from the papers of I.D. Koval'chenko, M.A. Barg, V.M. Lavrovskii, E.M. Zhukov, N.B. Sivachev, B.F. Porshnev, J. Kahk, A.N. Chistozvonov and others.[25]

A stimulating paper by R. Fišer on the processing of the data on a valuable source of foreing trade of the town of levoča from the 2nd half on the 17th century, registra tricesima, by computer was also published last year.[26] The author made use of co-operation with the Computer Laboratory of the Technical University in Brno and of the ASTI information programming system of the Institute of Scientific and Technical Information, which had been produced in 1966 and tested by 1968.[27] The ASTI system can be combined with the STAT system of statistical operations which carries out statistical evaluation. There are two conversion programs between these two systems, ASTI-STAT and STAT-ASTI.[28] Data on customs dues from the registra tricesima (i.e. tricesima registers) from the years 1656-1678 were analysed in detail here using a SAAB D21 computer. This involved a total of 1512 records of export and import of goods made by Levoča burghers, of which the following data were analysed: year, month and day of record, surname and name of trader, type of transaction (export-import), where to (with exports), customs due prescribed, kind and amount of cleared goods.

At the beginning of the deliberations on the technical revolution in historiography, generated by the use of modern computers, which will have far-reaching consequences as regards increasing its scientific standards in areas hitherto neglected, the following opinion was voiced:

"It is understandable that a historian, who is investigating astounding results, achieved in technical sciences, is impatient and would like to know the solution to the problems in his field which could not be solved so far for technical difficulties - it was not within the power of an individual or a team to manage too extensive complexes of referenced material. It is possible that these questions are still not on today's agenda. New methods are preferentially used in the natural and technical sciences. However, evolution is necessarily tending towards an increasingly wider use of these methods also in social sciences, particularly in various fields of national economy and history. It may seem that these deliberations are premature. However, the whistle of the first steam-driven trains was a warning to the teamsters. Revolution in transport had begun. Steam engines began to dahs forwards unheadingly. It was necessary to become a trained engine driver."[29] In the meanwhile man landed on the Moon and more and more sophisticated space ships and orbital systems have been launched into space. In historiography we must also leave the stage of the manufactory and, after the first swallows announcing the advent of a new epoch, welcome whole flocks of them. Only this will lead to a real technical revolution in historiography which will also change its theoretical, methodological and methodical bases.

Notes:

1) Ref. J. Purš, Historie, teorie informace a výpočetní technika (History, theory of information and computer equipment), Kybernetika ve společenských vědách, Praha 1965, p. 195, and J. Purš, Teorie informace a historická věda (Theory of information and historical science), Kybernetika a její využití, Praha 1965, p. 362. Later I recommended this term in the lecture on history and mathematics (ref. J. Purš, Historie a matematika (History and mathematics), Věstník ČSAV, Vol. 72, 1963, p. 472) and also in my contributions to the discussion at the 5th International Congress of Economic History in Leningrad in 1970, at the 13th International Congress of Historical Sciences in Moscow and in the article: J. Purš, Nástup historiometrie (Onset of historiometrics), Československý časopis historický (abb. ČSČH), Vol. 19, 1971, p. 158.

2) J. Purš, Historie a kybernetika (History and cybernetics), ČSČH IX, 1961, p. 396-399.

3) J. Purš, Modèle du rapport existant sous le capitalisme prémonopoliste entre l'accroissement du mouvement des grèves et le développement de la production de fabrique, Historica VII, Prague 1963, pp. 85-97 and in Czech in ČSČH XI, 1963, No. 1, pp. 34-46.

4) J. Purš, Struktur und Dynamik der industriellen Entwicklung in Böhmen im letzten Viertel des 18. Jahrhunderts, Jahrbuch für Wirtschaftsgeschichte, Berlin 1965, Vol. I, pp. 160-196, Vol. II, pp. 103-124 (44 tables, 5 cartograms, 17 diagrams). Supplement - Überreicht auf dem Dritten Internationalen Kongress für Wirtschaftsgeschichte im August 1965 in München (also as special issue).

5) Atlas československých dějin (Atlas of Czechoslovak history), Chief Scientific Editor J. Purš, Praha 1965, ÚSGK (CAGC); J. Purš, Historical Atlas of Czechoslovakia, Journal of the Czechoslovak Geographical Society, Supplement for the 20th International Geographical Congress, London 1964, Praha 1964, pp. 201-207; J. Purš, Historical Atlas of Czechoslovakia, 20th International Congress, United Kingdom, Abstracts of Papers, Supplement, Editor F.E. Ian Hamilton, London 1964, pp. 25-26.

6) J. Purš, La diffusion asynchronique de la traction à vapeur dans l'industrie en Europe au XIX^{e} siècle, In: L'acquisition des techniques par les pays non-initiateurs, Colloques Internationaux du Centre National de la Recherche Scientifique No. 538, Paris 1973, pp. 75-120 and the discussion on pp. 121-123; J. Purš, Metoda měření asynchronismu některých historických procesů (Method of measuring the asychronism of some historical processes), ČSČH XVIII, 1970, pp. 161-194; J. Purš, Průmyslová revoluce (Industrial revolution), Praha

1973, pp. 471-493 and graphs in the appendix, and J. Purš, Asynchroniczne upowszechnianie energetyki parowej w krajach Europy (Asynchronous propagation of steam power in European countries), in: I. Pietrzak-Pawlowska (ed.), Gospodarka przemyslowa i pczatki cywilizacji technicznej w rolniczych krajach Europy, Wroclaw, Warszawa, etc, 1977, pp. 75-91 and 218-219 (English summary).

7) J. Purš, Parní pohon v průmyslu a ekonomický růst v 19. století (Steam drive in industry and economic growth in the 19th century), Dějiny věd a techniky, Vol. 3, 1970, pp. 198-214.

8) J. Purš, Traction à vapeur dans l'industrie en tant qu'indice du développement des cycles économiques au 19e siècle, Colloque international d'ICOHTEC a Jablonna, Pologne 17 août-1 septembre 1973.

9) J. Purš, Historiometrics, Historical and Carthographic Information and Computers, History and the Computer, International Conference on Quantitative Methods and Computer Applications in History, Uppsala, Sweden, 24-30 June 1973, 22 pp. See also J. Purš, Historiometrie, historickokartografická informace a počítače (Historiometrics, historico-cartographic information and computers), Historická geografie 10, Praha 1973, pp. 27-54; J. Purš, Historiometrics, Historical and Cartographic Information and Computers, Historical Method Newsletter, Pittsburgh, Vol. 7, No. 3, June 1974, History and the Computer: A Special Issue, pp. 134-144.

10) M. Švankmajer, V. Vaněk, K otázkám použití vypočetní techniky v historické práci (On the problems of using computer equipment in historical work), Sborník Racionalizace práce. Strojové zpracování informací v knihovnách a útvarech TEI (Computer processing of data in libraries and departments of TED), Praha 1963, pp. 93-103; M. Švankmajer, Historik a soudobá technika (The Historian and contemporaneous technology), Zprávy ČSHS VII, 1964, No. 1, pp. 24-27; Idem, Kybernetika a historická věda (Cybernetics and historical science), Tvorba Vol. XXVII, 1962, No. 42, p. 990; Idem, K otázce strojních rešerší v historii (On the problem of computer literature research in history), ČSČH XIII, 1965, No. 1, pp. 49-64. Later this author returned to the problems of automated processing of registers, ref. Rejstříky zpracované počítačem (Registers processed by computer), Vědecké informace, Vol. 8, 1971, Nos. 3-4, pp. 91-101.

11) J. Folta, K sovětským pracím z "matematické historiografie" (On Soviet papers in "Mathematical Historiography"), ČSČH III, 1964, No. 6, pp. 888-892.

12) J. Folta, L. Nový, Sur la question des méthodes quantitatives dans l'histoire des mathématiques, Acta historiae rerum

naturalium necnon technicarum, Praha 1965, pp. 3-35; L. Nový, J. Folta, K otázce užití kvantitativních metod v dějinách matematiky (On the question of using quantitative methods in the history of mathematics), Sborník pro dějiny přírodních věd a techniky, Vol. 11, 1966, pp. 25-55; L. Nový, J. Folta, O primeneniyi kolichestvennykh metodov v issledovanii po istorii matematiki (On the application of quantitative methods in the history of mathematics), in: "Analiz tendentsii i prognozirovanie nauchno-tekhnicheskogo progressa", Kiev 1967, pp. 235-262.

13) V. Pletka, Strojové zpracování informací v archivní a historické práci (Computer processing of data in archival and historical work), doctor's thesis at the Faculty of Philosophy of the Charles University, Praha 1964, manuscript 424 + 96 pp.; Idem, Současný stav a perspektivy strojového zpracování etnografických a folkloristických materiálů v ČSSR (Present state and prospects of computer processing of ethnographic and folkloristic materials in the ČSSR), Česká literatura 51, 1964, No. 4, pp. 193-201; Idem, Možnosti využití strojního zpracování vědeckých informací v musejní práci (Possibilities of exploiting computer processing of scientific information in museum work), Musejní a vlastivědná práce, Vol. IV, 1964, No. 1, pp. 25-34; Idem, Mechanisace vědecké dokumentace k nejnovějším dějinám (Mechanization of scientific documentation relevant to the most recent history), "Výměna zkušeností", Vol. 5, Státní technická knihovna v Praze, 1965, pp. 54-107; Idem, Pokusy o mechanisaci vědeckoinformačních prací v archivech (Attempts at mechanizing scientific information work in archives), Sborník archivních prací XIV, 1965, No. 2, pp. 167-207; Idem, Strojové zpracování vědeckých informací (Computer processing of scientific information), Nová mysl, Vol. 1965, No. 1, pp. 56-64.

14) H. Poppová, Metody a techniky zpracování pramenů hromadné povahy (Methods and techniques of processing references of a mass nature), Slezský sborník 68, 1970, No. 1, pp. 62-68.

15) J. Honc, Populační vývoj šesti generací 125 českých panských rodů v letech 1502-1794 (Demographic evolution of six generations of 125 Czech noble families in the years 1502-1794), Historická demografie 3, 1969, pp. 20-51.

16) J. Honc, Vstupní data o cenách a mzdách na děrných štítcích pro elektronkové počítače (Input data on prices and salaries on punch cards for electronic computers), Praha 1971, (mimeographed).

17) J. Honc, Perspektivy samočinných počítačů v historické demografii a Russův pokus při zpracování matrik (Prospects of computers in historical demography and Russo's experiment in processing registers), Historická demografie 5, 1971, pp. 104-109.

18) K. Berka, Kritické poznámky k pojetí měření v československé sociologii (Critical comments on the concept of measurement in Czechoslovak sociology), Sešity ÚFS ČSAV, Vol. 1971, No. 6, pp. 25-64.

19) J. Řehák, Definice měření ve společenských vědách (Definition of measurement in social sciences), Sociologický časopis, Vol. 7, 1971, No. 6, pp. 638-648; J. Řehák, B. Řeháková, Míry statistické závislosti a ordinální znaky (Degrees of statistical dependence and ordinal symbols), Sociologický časopis, Vol. 11, 1975, No. 1, pp. 75-92.

20) J. Bouška, Úvaha o tendencích v ekonomicko-matematickém výzkumu (Deliberation on tendencies in economico-mathematical research), Ekonomicko-matematický obzor, Vol. 8, 1972, No. 4, pp. 361-368.

21) J. Vlček, Systémové zpracování dat na počítači (System computer data processing), Praha 1973.

22) T. Málek, Samočinné počítače v humanitních vědách (Computers in the humanities), Slovenska archivistika V, 1970, No. 2, pp. 289-303.

23) Strojove a vyššie matematické metódy práce v hospodárskych a sociálnych dejinách (Computer and high mathematical methods of work in economic and social sciences. An excerpt from the reports to the 5th International Congress on Economic History in Leningrad, August 1970), ed. A. Špiesz, Bratislava (mimeographed), s.d.

24) J. Gottwald et al., K použití statistických metod v oblasti dějin cen (On the use of statistical methods in the field of history of prices), ČSČH XXII, 1974, No. 3, pp. 568-587.

25) M. Hroch, V. Hrochová, L. Kobylková, Metodologické problémy v současné sovětské historiografii (Methodological problems in contemporary Soviet historiography), ČSČH XXV, 1977, No. 6, pp. 858-888.

26) R. Fišer, Počítač - informační programový systém - registra tricesima (The computer - information programming system - tricesimal registers), Historický časopis SAV, 25, 1977, No. 3, pp. 369-385. The author drew on his doctor's thesis "Zahraniční obchod Levoče ve druhé polovině 17. století (Foreign trade of Levoca in the 2nd half of the 17th century), Brno 1976, (manuscript).

27) M. Fendrych, Popis informačního programového systému ASTI (A description of the ASTI Information Programming System), UVTEI Praha 1974. The ASTI system has been improved to enable its use with the TESLA 200 computer of Czechoslovak production (Tesla - TIPS).

28) F. Krejcí, Systém statistických programmu na počítaci SAAB D21, (System of statistical programs for the SAAB D21 computer), VUT Brno 1974.

29) J. Purš, Historie a kybernetika (History and cybernetics), ČSČH IX, 1961, p. 399.

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CONFERENCE REPORT

SESSION OF THE NETWORK ON CRIMINAL JUSTICE AND DEVIANCE AT THE SSHA MEETING, COLUMBUS, NOV. 3-5, 1978

At the recent annual meeting of the SSHA in Columbus, Ohio, our network had a sponsored session and a network meeting. The session, "Theory and Practice in Criminal Justice", had three papers: Roger Lane (an historian), "Suicide as a Source of Nineteenth Century Social History"; Patricia O'Brien (an historian), "Agricultural Colonies for Juvenile Offenders in Nineteenth Century France"; Harold Pepinsky (a criminologist), "Social Historians: Write Your Criminologists". Ellen Dwyer and Eric Monkkonen commented.

Lane presented an analysis of sources showing that the suicide data of the Philadelphia coroner's office reflected suicidal reality accurately. He then demonstrated that the majority of suicides were white males and argued that the new urban-industrial occupations generated internal stress which led, in turn, to a greater proportion of workers in these occupational categories commiting suicide. He concluded by suggesting that suicide statistics be utilized by historians for greater description and understanding of ethnic, racial, and gender groups.

O'Brien described the rise and decline of agricultural reform prisons in mid-nineteenth century France, showing how the contemporary theory that urbanization caused juvenile crime schooled the thinking which tried to turn juvenile offenders into agricultural workers. The ironic outcome of these efforts was that rather than de-urbanizing the young people, the agricultural schools reproduced, in greater intensity, the unhealthful social conditions of the urban setting in a rural place. Needless to say, the schools were not successful in their rehabilitative efforts.